QuikChem® 8000 Series
Automated Ion Analyzer

Flow Injection Analysis
Ion Chromatography

LACHAT INSTRUMENTS

QuikChem® 8000 Series Flow Injection Analysis System

Maximum Productivity in Automated Ion Analysis

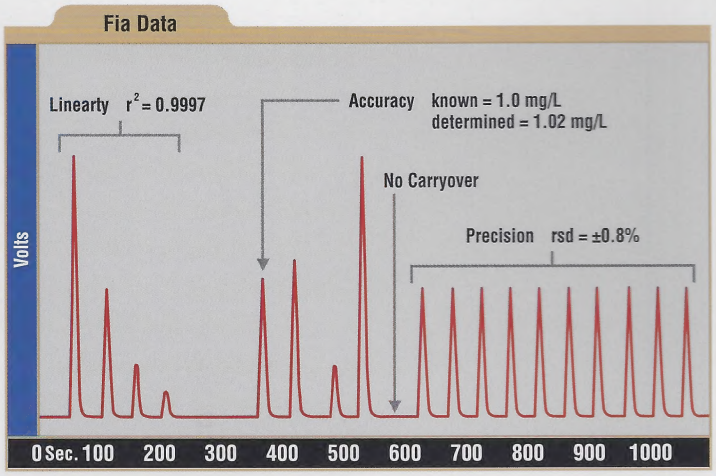
For 20 years, Lachat Instruments has led the world in productivity for automated ion analysis based on flow injection analysis (FIA) technology. The simplicity and ruggedness of FIA, the outstanding accuracy, precision, minimum detection limits and dynamic ranges of our guaranteed QuikChem methods and our unique Data Quality Management closed-loop software system combine to give the best analytical results in the shortest time compared to any other ion analyzer.

FAST·ACCURATE
QuikChem®
·Q·U·A·L·I·T·Y·
REPRODUCIBLE

FIA was originated in 1975 by scientists who were trying to process large numbers of samples and became frustrated with the bottleneck to their productivity caused by their segmented flow analyzers (SFA). Their initial innovations leading to Flow Injection Analysis were as follows:

- **Eliminating the bubbles from the analytical stream**
- **Decreasing the inner diameter of the reactor tubing**
- **Precisely injecting samples into the analytical stream**

The result was analytical peaks with very rapid rise and recovery times and complete inter-sample washout.


Fia Data
Linearity $r^2 = 0.9997$
Accuracy known = 1.0 mg/L
determined = 1.02 mg/L
No Carryover
Precision rsd = ±0.8%
Volts
0 Sec. 100 200 300 400 500 600 700 800 900 1000

Typical FIA peaks illustrating high precision and complete inter-sample washout.

As the technology developed, many other aspects of FIA were discovered that have become uniquely beneficial to routine analytical laboratories.

Startup and shutdown times are so short that it is practical to change over between analytical methods rather than dedicating channels as is required with SFA.

Short analysis times, enabled by the highly reproducible sample volumes and residence times allow samples to be analyzed in near real-time.

Data quality can be monitored and controlled as the analyses proceed, not at the end of a tray run when it is too late.

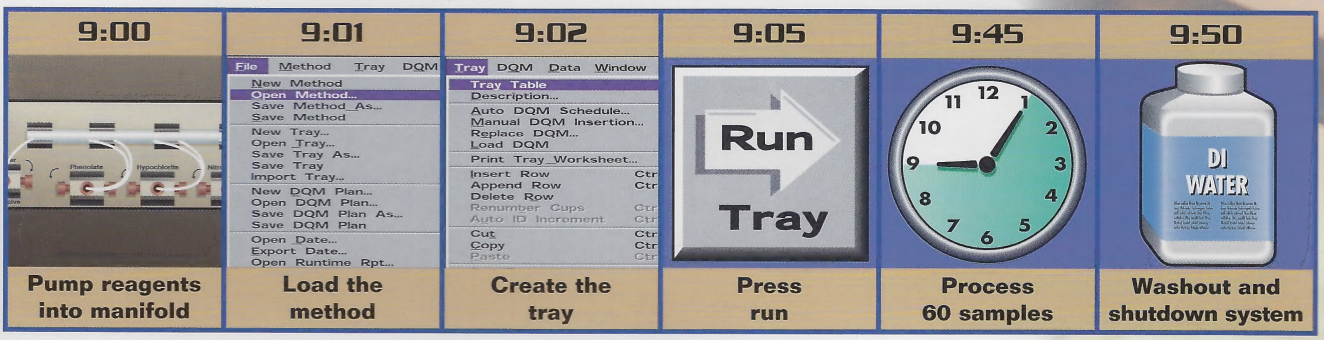
FIA Productivity Characteristics

- **Fast Startup**
  ~5 minutes
- **Rapid Analysis**
  20 to 60 seconds is typical
- **High Sample Throughput**
  60 to 120 samples per hour is typical
- **Broad Working Range**
  Parts per trillion to percents
- **Complete Baseline Resolution**
  No carryover between samples
- **Wide Dynamic Range**
  2 to 3 decades is typical
- **Fast Shutdown**
  ~5 minutes
- **Rapid Method Changeover**
  ~10 minutes

Keys to Productivity

Simplicity

Daily operation of a QuikChem Flow Injection Analyzer is simple:



Analytical Flexibility

Over 400 QuikChem methods testify to the ability of flow injection analysis and ion chromatography to address a tremendous diversity of analytical challenges. From acidity to zinc, the table below illustrates the sample types and analytes for which QuikChem methods are available.

Analyte	Acidity	Alkalinity*	Aluminum	Ammonia*	Boron	Bromate*	Bromide*	Calcium	Chlorate*	Chloride*	Chlorite*	Chromium*	Color	Conductivity*	Cyanide*	Fluoride*	Glucose	Glutamate	Glutamine	Hardness*	Iron	Lactate	Magnesium	Manganese	Molybdenum	Nitrate*	Nitrite*	Nitrogen (TKN)*	Organic Acids	Phenolics*	Phosphate*	Phosphorus*	Potassium	Silica*	Sodium	Sulfate	Sulfide	Sulfite	Zinc
Drinking Water	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●				●	●		●	●		●	●			●	●	●	●	●	●	●	●	●	
Waste Water	●	●	●	●	●		●	●		●		●	●	●	●					●	●		●	●		●	●	●		●	●	●	●	●	●	●			●
Sea Water				●				●		●											●					●	●				●	●		●		●			
Brackish Water				●																						●	●				●	●		●					
Brines				●			●																													●				
Soils			●	●	●		●			●														●	●	●		●		●	●		●	●		●			●
Plants					●																				●	●		●			●	●	●			●				
Feeds								●																				●				●								
Cell Liquors									●	●																														
Fermentor Solutions				●													●	●	●			●							●		●								
Wines	●																																				●		

Analytical Method

FIA	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IC						●	●	●	●	●	●					●					●		●	●	●	●			●		●		●	●	●	●				

*USEPA/DIN/ISO Approved

Guaranteed Data Quality

Whether your laboratory is performing regulatory monitoring or product quality control, data quality is of the utmost importance. While initial and ongoing instrument validation protocols are important to perform, a need exists for continuously monitoring data quality in daily operation to absolutely ensure that the instrument, method and software are all operating according to specification.

Row	Sample ID	Cup #	Sample Type	Level	Reps
1	Std. 1	1	CalStd	1	2
2	Std. 2	2	CalStd	2	2
3	Std. 3	3	CalStd	3	2
4	Std. 4	4	CalStd	4	2
5	Std. 5	5	CalStd	5	2
6	Std. 6	6	CalStd	6	2
7	zero ppm	1	Blank	0	1
8	groundwater	2	Unknown	0	1
9	drinking water	3	Unknown	0	1
10	Std. 1	4	RelChkStd	0	1
11	River 1	5	Unknown	0	1
12	Effluent	6	Unknown	0	1
13	Influent	7	Unknown	0	1
14	Rain water	8	Unknown	0	1
15	Dup1	9	Dup1	0	1
16	Dup2	10	Dup2	0	1
17	spike	11	Spiked	0	1

Data Quality Management™ (DQM) is a unique software tool pioneered by Lachat Instruments to perform closed-loop control of the analytical process. DQM supports many different QC/QA protocols and provides the following benefits:

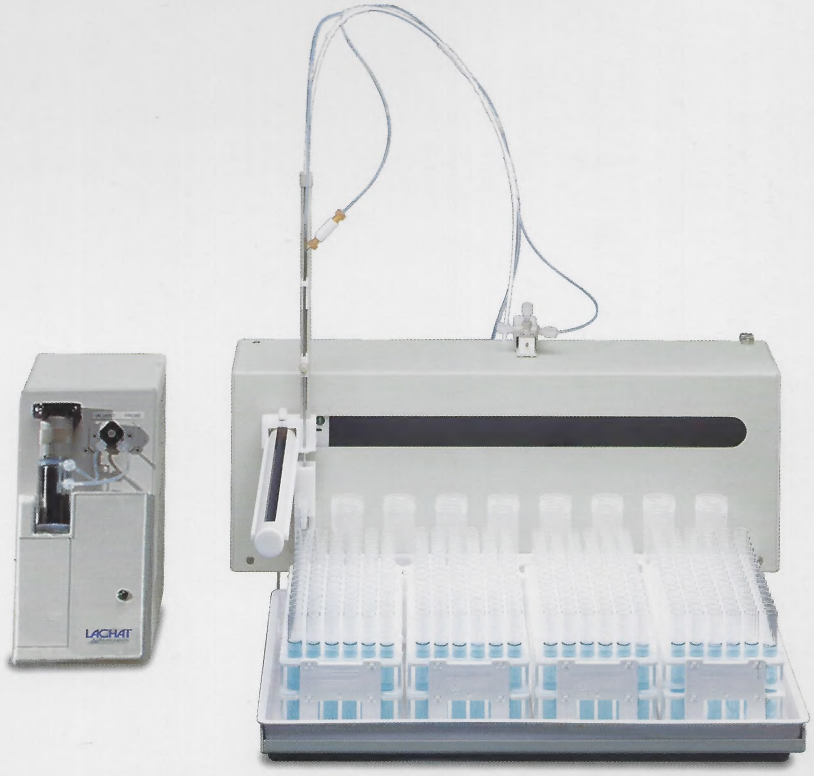
- **Assured accuracy and precision of results**
- **Minimal operator intervention**
- **User-defined quality control samples and standards**
- **User-defined quality control limits**
- **User-defined corrective actions**
- **Maximum confidence of customers and regulatory agencies in results**
- **Reports generated automatically in your format**

Complete Automation with Optional XYZ Sampler and Dual Resolution Dilutor

To accommodate large sample loads, the XYZ Sampler offers up to 360 sample and 16 bulk standards positions for both calibration and QC standards. The integral wash bath ensures complete washout of the sampling line to prevent inter-sample carryover and cross-contamination.

The Dual Resolution Dilutor automates preparation of working standards from a stock standard. Also, a unique algorithm called Intelligent Automated Dilution estimates the concentration of off-scale samples, performs the required dilution and re-runs the sample, all automatically with no operator intervention.

Laboratories with smaller budgets and lower automation requirements can select the Sequential Sampler. This unit provides 90 sample and 16 standard positions and incorporates a wash bath. It is not compatible with the Dual Resolution Dilutor.



XYZ Sampler and Dual Resolution Dilutor

QuikChem® 8000 Series Ion Chromatography System

A World of Difference in Ion Profiling

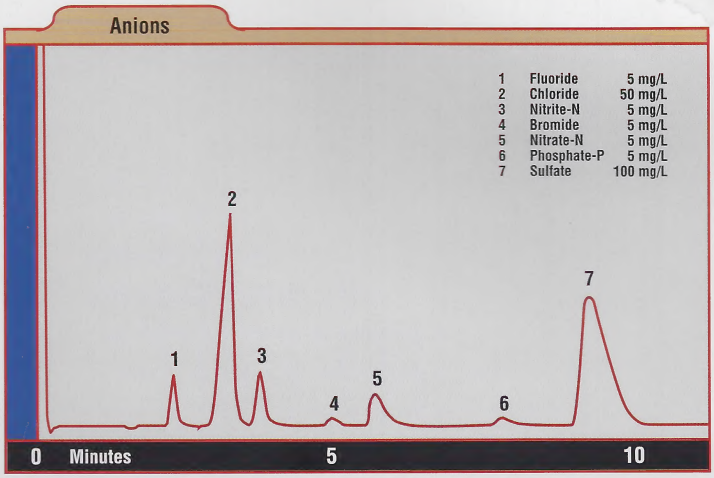
Integrated with the flow injection analyzer or available as a standalone instrument, QuikChem Ion Chromatography adds the power to profile samples for a class of ionic species. While flow injection analysis is ideally suited for processing relatively large numbers of samples for between 2 and 4 analytes simultaneously, ion chromatography enables the determination of multiple ions from a single injection.

FIA and IC are complementary analytical techniques that are commonly used in the same laboratory. By incorporating both technologies into a single instrument, the following benefits are achieved:

- **Operation of FIA and IC simultaneously and independently on the same instrument platform**
- **Shared use of several peripherals including sampler, dilutor, sampling pump, electronics unit and data station**
- **Uniform operating protocols**
- **Training and support provided by one company**
- **Reduced footprint**

The QuikChem IC Option is available with your original system purchase, integrated at the factory, or as a simple field upgrade.

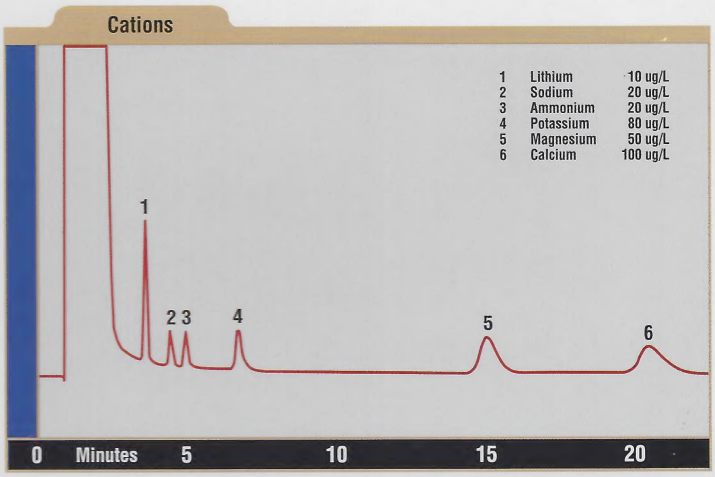
With the availability of both Flow Injection Analysis and Ion Chromatography, Lachat Instruments offers the most comprehensive ion analysis solutions available today. For complete information on QuikChem Ion Chromatographs, please request Lachat Catalog No. 1103/6-97.



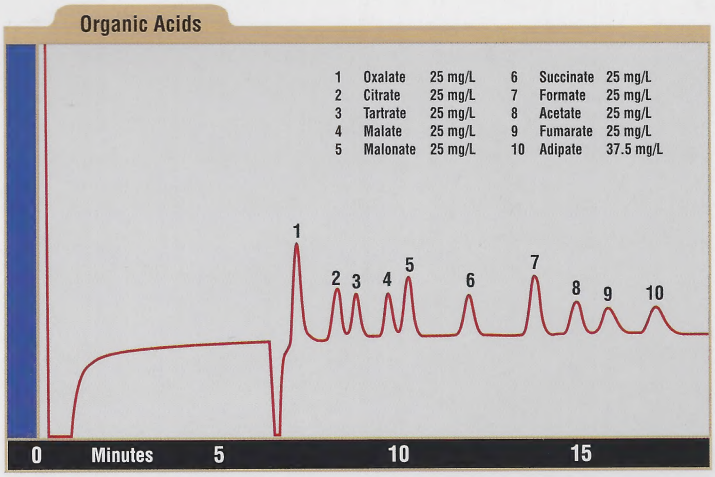
Just one sample injection into a QuikChem IC Anion Profiling Module provides concentration values for 7 anions in under 10 minutes.

FIA and IC Methods Commonly Used for USEPA/ISO/DIN Regulatory Monitoring of Wastewater and Drinking Water

Alkalinity	Hardness
Ammonia	Kjeldahl Nitrogen
Bromate	Nitrate
Bromide	Nitrate + Nitrite
Chlorate	Nitrite
Chloride	Ortho-phosphate
Chlorite	Phenolics
Chromium	Phosphorus, Total
Conductivity	Silicate
Cyanide	Sulfate
Fluoride	Surfactants



Selection of the QuikChem Cation Profiling Module will allow determination of both alkali metals and alkaline earths in about 20 minutes.



Up to 10 organic acids can be determined in under 20 minutes by inserting the QuikChem Organic Acids Profiling Module.

LACHAT INSTRUMENTS

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